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Biologically-Inspired Intelligent Robots

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Throughout history, humans have always sought to mimic the appearance, mobility, functionality, intelligent operation, as well as the decision-making and thinking process of biological creatures. This desire to imitate nature includes also mimicking the characteristics of humans. The field of biologically inspired technologies, which has the monikers biomimetics, led to the development of systems that exhibit realistic appearance and behavior. Robots, which verbally and facially express emotions as well as respond emotionally to such expressions, are now being developed with greater capability and sophistication. Imagine a person walking towards you where suddenly you notice something weird about him - he is not human but rather it is a robot. Your reaction would probably be "I can't believe it but this robot looks very much real" just as you would react to an artificial flower that is a good imitation. You may even proceed and touch the robot to check if your assessment is correct but to your astonishment, as oppose to the case of artificial flowers, the robot may be programmed to respond verbally and/or physically to your touch. This science fiction scenario may become a reality as the current trend continues towards developing biologically inspired technologies and robots that appear and behave as human or animals. This presentation will review the trend with emphasis on the emerging technology of artificial muscles, which is a key to enabling the development of such increasingly realistic robots.